Cogent Economics & Finance

ISSN: (Print) (Online) Journal homepage: www.tandfonline.com/journals/oaef20

Optimizing earning quality in bank finance: a theoretical model and empirical investigation in India

Ketan Mulchandani, Santanu K. Ganguli & Kalyani Mulchandani

To cite this article: Ketan Mulchandani, Santanu K. Ganguli & Kalyani Mulchandani (2025) Optimizing earning quality in bank finance: a theoretical model and empirical investigation in India, Cogent Economics & Finance, 13:1, 2455386, DOI: 10.1080/23322039.2025.2455386

To link to this article: https://doi.org/10.1080/23322039.2025.2455386

Published online: 24 Jan 2025.

COGENT ECONOMICS & FINANCE
2025, VOL. 13, NO. 1, 2455386
https://doi.org/10.1080/23322039.2025.2455386

FINANCIAL ECONOMICS | RESEARCH ARTICLE

OPEN ACCESS Check for updates

Optimizing earning quality in bank finance: a theoretical model and empirical investigation in India

Ketan Mulchandani[a], Santanu K. Ganguli[b] and Kalyani Mulchandani[c]

[a]KJ Somaiya Institute of Management, Somaiya Vidyavihar University, Mumbai, India; [b]Jaipuria Institute of Management, Noida, India; [c]Department of Technology Management, Mukesh Patel School of Technology Management and Engineering, Narsee Monjee Institute of Management Studies (NMIMS) University, Deemed to be University, Mumbai, India

ABSTRACT

Agency theory highlights that debt serves as a tool to monitor managerial behaviour of the borrowing firms. We argue that in a privately negotiated banking system, the monitoring should encompass the earning quality of the firms. Accordingly, the paper develops a theoretical model that shows an inverted U-shaped relationship between earning quality and bank finance, implying an 'optimum earning quality' that maximises the benefit of the monitoring role of bank finance. The empirical results based on a sample of 1511 firm-years support the model and imply that the bankers' monitoring must be adequate to encompass earning quality to generate benefit to cover cost of the latter at higher level of debt. Shortcoming of supervision means earning quality being compromised that leads to higher credit risk for the bankers. The bankers seem to rely more on collaterals over earning quality for credit risk mitigation. This finding aligns with the objective of the study which highlights a need for incorporating more robust mechanisms to evaluate earning quality of the borrowers. Therefore, the bankers' monitoring must cover quality of earning of the borrowers more rigorously at higher level of debt.

IMPACT STATEMENT

Agency literature suggests that debt is beneficial because it monitors the behaviour of the managers of the borrowing firms. To reap the benefit, the article posits that - in a privately negotiated banking system the monitoring should encompass the earning quality (EQ) of the borrowers. But EQ comes with a cost, as such, there is a 'trade off' between benefit and cost, revealing an 'optimum earning quality' that maximizes the net benefit of monitoring. Based on the argument a model is developed showing a concave relation between EQ and bank finance. Empirical evidence based on a sample of large and diverse firms in India supports the model, and further reveals that the monitoring by the bankers of the accounting numbers of the borrowing units may be suboptimal when the debt financing is high, and borrowing seems to be extended to the firms with lesser sustainable earning. For mitigating credit risk the bankers seem to depend more on collaterals. The findings of the paper suggest that the bankers' due diligence should adequately take into account the EQ of the borrowing firms as disciplining and credit risk mitigation measures.

ARTICLE HISTORY
Received 13 August 2024
Revised 9 January 2025
Accepted 14 January 2025

KEYWORDS
Agency cost; earnings quality; bank finance; bank monitoring; earnings quality optimization

SUBJECTS
Economics; Finance; Business, Management and Accounting

JEL
G21; G3; G32; M41

1. Introduction

The paper develops a theoretical model showing the effect of the earning quality of the borrowing firms on bank finance from the agency theory standpoint in a privately negotiated banking system, followed by an empirical investigation.

The Banking Regulation Act of India and the Reserve Bank of India's (the central banker) directives issued from time to time sought to ensure that bank lending is not used for the private benefit of the directors and managers of the borrowing firms[1]. Instead, bank lending should be used to optimise the resources procured to benefit the investing public through good governance. The agency literature (Harris & Raviv, 1990; Jensen

CONTACT Ketan Mulchandani ketanmul@gmail.com KJ Somaiya Institute of Management, Somaiya Vidyavihar University, Mumbai, India; Jaipuria Institute of Management, Noida, India

& Meckling, 1976) goes a step forward and predicts that debt has a monitoring role in disciplining the behaviour of managers. This means that the debt forces a firm's managers to use corporate resources efficiently in the best interest of the investors rather than for their private benefit. The argument can also be extended to include the role of managerial behaviour in reporting the accounting numbers. If the debt influences the managers to act in the best interest of the investors, then as a corollary, we can presume that the managers should report the accounting numbers transparently so that the investors can make informed decisions about their investments in a firm. Therefore, investors should prefer debt as a means of financing because that will pressure the managers to report 'true and fair' accounting numbers. For agency problem mitigation, the fundamental assumption is that the lenders will be vigilant and keep an eye on financial accounting numbers that reflect the efficient utilisation of resources and the genuineness of the collateral securities offered for procuring bank finance. From the banker's perspective, credit risk management emanating from lending decisions is the most important factor in banking operations and management. The Reserve Bank of India (RBI, 2010) broadly defines credit risk as the possibility of losses associated with 'diminution in the credit quality of borrowers or counterparties'. In a bank's advance portfolio, losses arise from the inability or unwillingness of a borrower or counterparty to meet commitments about lending, trading, settlement and other financial transactions. As per the policy guidelines, banks perform due diligence (alternatively known as credit appraisal) before granting or enhancing credit facility or limit to a borrower to mitigate credit risk with reference to collateral securities offered. The credit appraisal should cover the quality of earning numbers in extending the credit facility and review process, as wrong accounting numbers can hide the operational efficiency and the nature and quantum of collaterals.

Thus, we can say that there exists a commonality of interest between investors and lenders so far as earning quality is concerned – investors' interest centres around agency problem mitigation and bankers' perspective are more direct – being credit risk mitigation. In other words, good earning quality benefits the borrowers and lenders from their respective perspectives.

So far, the studies concerning the role of EQ as an influencer in determining the borrowing firm's debt level from the investors' agency perspective and the bankers' credit risk aspect continue to remain a relatively unexplored area.

The Indian banking system struggles with NPA (non-performing assets) and stressed assets problems. Despite a robust regulatory framework, NPAs and restructured assets in 2018 were estimated at $160-$170 billion. This was roughly equal to 7% of India's annual GDP (Motilal, 2018). To address the problem of mounting NPA, Rajan (2016), among others, pointed out the deficiencies in appraisal, evaluation and monitoring as the significant reasons for NPAs. Then he went on to suggest - 'deficiencies in evaluation can be somewhat compensated for by careful post-lending monitoring, including careful documentation and perfection of collateral, as well as ensuring assets backing promoter guarantees are registered and tracked'. Besides documentation and collaterals, we emphasise that the EQ should be one of the primary considerations for the appraisal and evaluation of the loan proposals. Penman (2003) posits that the reliability of reported earnings is critical in investors' investment decisions and lending decisions by borrowers, as that can be used to make reasonable forecasts about the firm's prospects. In various cases, it was found that banks didn't create sufficient provision to cover for delinquencies. This short-term view of banks have provoked the researchers to study earnings management, which may be the result of either under or over-provisioning for non-performing loans (Beatty et al., 1995). Possibility of practicing earnings management through non-performing loans is more than performing loans due to stricter and higher provisioning requirements (Pandey & Guhathakurta, 2019).

Therefore, the fundamental research question that arises in the context is – do the bankers give adequate attention to the quality of accounting numbers reported by the borrowing firms for granting and renewing credit facilities as an integral part of their monitoring role? In this context, the paper explores the relationship between earning quality and borrowing.

More specifically, in this paper, we develop a theoretical model showing the likely relation between EQ and bank finance, and then we explore empirically whether the relation is consistent with the argument and the model developed.

A large part of the empirical literature on lending as a means of financing centres around the 'trade-off' between the tax shield of debt vis-a-vis bankruptcy cost, culminating in the optimum debt capacity of a firm (Modigliani & Miller, 1963), and pecking order theory of debt (Myers, 1984) based on information economics.

A vast body of empirical literature (Hirota, 1999; Myers & Majluf, 1984; Rajan & Zingales, 1995; Titman & Wessels, 1988) has come into being -showing different determinants of debt financing. The findings are broadly consistent with the trade-off and pecking order theory. Subsequently, several studies record corporate governance's (CG) impact and the different CG characteristics' (Ganguli, 2013; Shleifer & Vishny, 1997; Tahir et al., 2020) impact on debt financing. Also, a considerable body of recently developed literature records how CG (Nguyen et al., 2024; Rezaee & Safarzadeh 2023) and various CG variables like ownership concentration (Arthur et.al, 2019) and board diversity (Hoang et al., 2017), restrain/impact earning management. Modani et al. (2023) record the impact of the regulatory environment and CG variables on EQ. In other words, these studies cover the role of CG and various components of CG on EQ. A study in the US context by Ghosh and Moon (2010) records how debt impacts EQ. A recent empirical study by Ganguli and Guha Deb (2023) in the Indian context observe that borrowing firms may report discretionary or abnormal accrual for availing of higher credit facilities. The said study has an ethical underpinning.

So far, no conceptual study detailing the role of EQ in bank financing, followed by any empirical evidence has been conducted in the emerging market context from the agency theory perspective of the investors and bankers' perspective of credit risk mitigation. Our study attempts to address the research gap in this respect.

This study is important as it attempts to show - in addition to various well-documented characteristics like profitability, risk, size or tangibility as collateral, age, and ownership concentration impacting the capital structure of a firm, how the EQ as an additional determinant should impact bank financing from agency angle, in a privately negotiated banking system where the corporate debt market is very thin (Sengupta & Anand, 2014). Theoretically and empirically, the study contributes considerably to the literature on agency theory, EQ, and bank financing systems. More specifically, the contribution of the present study is unique in the sense that – *first,* it theoretically argues and develops a model highlighting - in a privately negotiated banking system – how and to what extent the bank financing as a mitigator of agency problem gets impacted by the EQ. *Second,* the study empirically examines the impact of EQ on bank finance in the backdrop of the model developed. *Third* – the interpretation of the empirical results records a systematic weakness of the monitoring system by the bankers, being too dependent upon the collateral securities and documentation rather than ensuring the operational efficiency of the borrowing firms revealed through the accounting numbers.

Among the EU countries - Germany, Portugal, Ireland, Spain, Italy, Austria, Greece have large banking sectors and rely less on market financing. Almost all the countries of Africa follow bank-based financial system. The findings of the study are of relevance for such countries.

The remainder of the paper is organised in the following way. Section 2 consists of argument development and model. Section 3 discusses the pertinent literature and hypotheses. Section 4 describes the data and methodology. Section 5 details the empirical results, section 6 discusses the results, and section 7 concludes with a summary of the findings.

2. Argument and model

For credit risk mitigation, the banks monitor the behaviour of the borrowers. For this purpose, the bankers impose conditions for granting and enhancing credit facilities in the debt covenants. According to Tirole (2006), maintaining adequate securities through a mortgage or pledge of tangible and cash-generating assets is essential for granting credit. He posits that the loan taken for financing a project will be viable if the borrower behaves, i.e. he does not indulge in self-dealing. In order to ensure that the borrower behaves, he must have some assets to offer as collateral to avail of a bank loan. Without collateral, the banker has to charge a very high interest rate to mitigate the risk of moral hazard arising from the loan. A high rate of interest will make the project unviable for the borrower. Hence, offering collateral should be a precondition for debt financing.

In the above backdrop, we argue that the EQ is important as the assets offered as collateral must be reflected in the accounting numbers in the financial statements, ensuring – a) the assets exist, and b) the carrying amounts of the assets are reliable based on which loan can be granted. Further, in the case of fair value accounting, a reader of the financial statements might get an idea about the quantum and timing of cash flow that might be generated from such assets. From the lender's standpoint, higher EQ means higher credit quality, lesser risk of default, and enhanced motivation to grant credit at a lesser cost due to the mitigation of moral hazard problems. From the borrower's perspective, the benefits accrue in the form of lower agency

costs as the bankers monitor the behaviour of the managers more objectively through the prism of the accounting numbers, lesser interest costs as the moral hazard problem are purportedly less, and so on.

The bankers have to monitor whether the EQ of the borrower is adequate and commensurate with the size and the extent of the loan facilities provided. In order to ensure high EQ, the borrower has to incur higher costs for – establishing and maintaining an elaborate internal control system, ensuring appropriate internal and external audit quality, and appointing competent persons as audit committee members and independent directors.

Hence, we formulate the following objective function of benefit of the borrower $-\underset{EQ}{\text{Max}}\, L = L(EQ, \overline{A}) - (C(EQ), \overline{A})$

Here, L is the net benefit of the debt financing arising from the monitoring of EQ of the borrowing units by the banker. The higher the debt, the higher the intensity of monitoring of EQ by the banker to mitigate the default risk. In the process, the net benefit accruing to the borrower of better EQ in lowering the information asymmetry, agency cost and the moral hazard problem will also increase. The increase of such benefit of the borrower attributable to more intense monitoring for higher debt will take place at decreasing rate, as such, $\frac{dL}{dEQ} > 0$, and $\frac{d^2L}{dEQ^2} < 0$, signifying that L increases at a decreasing rate as EQ increases.

$\overline{A}$ is the asset required for debt financing as collateral and is exogenous.

C is the cost incurred by the borrower to ensure high EQ as described, and is an increasing function of the latter.

We formulate the following equation for the objective function:

$$L = EQ^{\frac{1}{2}} - EQ^2 \tag{i}$$

In order to maximise L -

a. the first-order derivative condition of the equation (i) is –

$$\frac{dL}{dEQ} = \frac{1}{2}EQ^{-1/2} - 2EQ = 0 \tag{ii), and}$$

b. the second-order derivative of the equation (ii) would be –

$$\frac{d^2L}{dEQ^2} = -\frac{1}{4}EQ^{-\frac{3}{2}} - 2 \tag{iii}$$

From (iii), we find that -

$\frac{d^2L}{dEQ^2} <$ 0. (EQ being positive)

So, the second-order derivative condition is fulfilled.

Economically, it means that if the rate of change of benefit accruing to the borrowing firms that arises from the closer monitoring of EQ by the banker (as the bank financing rises) is less than the rate of change of marginal cost for the betterment of the EQ, then the level at which marginal benefit of monitoring of EQ equals the marginal cost associated therewith is the ideal level of EQ, where the net benefit of bank financing will be maximum from the agency perspective. Thus, initially, until a certain level, a positive association exists between the EQ and L, beyond which the cost of achieving still better EQ exceeds benefits; as such, there is an *optimum EQ* where the net benefit of L is maximised.

3. Literature survey

3.1. Capital structure (debt or leverage)

In this section, we briefly discuss the results of the previous studies regarding the determinants or factors that impact a firm's lending or capital structure.

Modigliani and Miller (1963), Alderson and Betker (1995), Titman and Wessels (1988) and Wiwattanakantang (1999), Galai and Masulis (1976), Myers (1977), Myers and Majluf (1984) generally highlight the relation between debt financing and the assets of a firm in various degrees. These studies consider tangibility as an important factor as the high carrying value of the pledge-worthy assets increases the debt capacity of a firm. In the context of lending by the Indian banks to the firms, Rajan (2016) emphasises this aspect and adequate documentation creating charges on such assets. Tangibility can be proxied by the ratio

of the carrying amount of tangible assets to total assets (Jadiyappa et al., 2021), alternatively - by the ratio of intangible assets to total assets. A positive relationship is expected in the first ratio and a negative in the second case. Studies by Rajan and Zingales (1995), Jordan et al. (1998), and Hirota (1999) record a positive association between tangible assets and debt. Titman and Wessels (1988) and Hirota (1999) find a negative relationship between risk (measured by the volatility of earnings) and leverage. The empirical findings suggest that the higher tangible assets that can be offered as collateral securities and low risk of operation are favourable for debt financing. The findings are consistent with the 'trade-off' theory.

Using the market-to-book value of the assets as a proxy for growth, Rajan and Zingales (1995) find an inverse relationship between growth and leverage.

Many firms with high and consistent profits prefer equity as a source of finance, which leads to the 'pecking order' theory proposed by Myers (1984). Empirical results of Rajan and Zingales (1995), Hirota (1999), and Titman and Wessels (1988) find support for the pecking order theory.

Jensen and Meckling (1976) put forward the agency argument of debt. They posit that debt and its associated monitoring role should drive the managers of borrowing firms to strive for superior performance and more transparency.

Lenders, especially banks, use earnings to determine the level of risk that may lead to default (Carmo et al., 2016) since accounting earnings provide detailed information about the firm's financial performance (Dechow et al., 2010). Good EQ is said to be the one that truly reflects a firm's operating performance (Dechow & Schrand, 2004). Ghosh and Moon (2010) also investigate the association between the Debt and EQ. Using Debt as an exogenous variable, they find a positive association between the EQ and Debt when the latter is low, but this association turns negative at a higher level of Debt. Ahn and Choi (2009) observe that a borrower's earnings management tendency generally decreases as the bank monitoring increases. Bigus and Weicker (2024) find that the firm's earnings quality improves significantly with a bank's equity stake, regardless of the state of the economy. Le et al. (2021) record that there is a negative relation between accrual quality and the cost of debt. This observation is consistent with the idea that faithful reporting of the accounting numbers might reduce the moral hazard risk.

Our model posits that in a privately negotiated bank financing system, the lenders (bankers) monitor managers' behaviour, which essentially reduces agency costs and moral hazard problems. The monitoring should cover EQ because good EQ reduces risk and information asymmetry as to a firm's economic performance for the lenders and agency costs for the borrowers. As the benefit of debt financing in reducing the agency cost is not observed directly, debt for the asset financing is used as a proxy for the agency cost mitigation. Further, we have argued (in Section 2) that the benefit of debt financing in the form of lesser agency cost increases at a decreasing rate as EQ increases. Initially, at a lower level of debt, the benefit of debt financing exceeds the cost of EQ when the requirement of the latter is not that intense. Higher EQ is required to avail of more debt financing. However, achieving a higher level of EQ involves a cost that increases monotonically, as per our argument and model. Beyond a certain point, the cost of achieving high EQ exceeds the benefit of debt. Empirically, in the paper EQ has been measured using residuals of the models of Dechow and Dichev (2002) and McNichols (2002). As better EQ is associated with higher cost, we take empirical measures of EQ as the proxy for its cost. Hence, we formulate the first, second and third hypotheses as under-

H1: There should be an overall negative relation between the EQ and the debt after controlling for profitability, risk, tangibility, growth and industry-level characteristics.

H2: There should be a positive relation between the low EQ and the low debt level after controlling for profitability, risk, tangibility, ownership concentration, growth, and industry-level characteristics.

H3: There should be a negative relation between the high EQ and the high debt after controlling for profitability, risk, tangibility, ownership concentration, growth and industry-level characteristics.

4. Data and methodology

4.1. Data

We have used BSE 500 companies for sample selection. BSE 500 companies account for 80-90% of the total market capitalisation of the listed companies. We have collected data for seven years, from 2013 to

2019, for non-banking and non-finance companies for which relevant data are available. Altogether, we have used the data of 357 levered firms representing different sectors for seven years involving 1511 firm years for empirical analysis.

The BSE 500 index is designed to provide a comprehensive representation of the Indian economy, capturing companies from a wide range of sectors. Some of the key sectors represented in the BSE 500 include: Information Technology (IT), Pharmaceuticals and Healthcare, Consumer Goods, Automobiles and Utilities, Metals and Mining, Infrastructure and Construction, Telecommunication: Telecom service providers and equipment manufacturers, Retail and E-commerce, Textiles and Apparel and Media and Entertainment.

This sectoral diversity ensures that the BSE 500 index presents a complete picture of the Indian economy as it captures trends, financials and dynamics from varied industries.

4.2 Methodology

We determine EQ, which is a qualitative variable. There are numerous empirical models measuring EQ. As per Sayers (1967), banking asset liquidity is of paramount importance as the bankers are required to serve the depositors as per their immediate demands. Accordingly, bankers prefer short-term financing like cash credit, bill discounting, letters of credit, etc. EQ derived using Dechow and Dichev (2002) model can be considered a good measure, as it maps accruals as a function of past, present and future cash flow. The model focuses on short-term accruals (working capital accruals) and their relation to cash flow and does not attempt to model long-term accruals. More specifically, a regression model is employed where the current accrual is considered a linear function of $CFO_{t-1,}$ CFO_t and CFO_{t+1}.

4.2.1. Dechow and Dichev (2002) model (DD)

The model is given below –

$$WCA_{i,t} = \alpha_o + a_1 CFO_{i,t-1} + a_2 CFO_{i,t} + a_3 CFO_{i,t+1} + \varepsilon_{i,t} \quad (1)$$

Where WCA_t is the firm's current accrual and is measured by change in accounts receivable + change in inventory – change in accounts payable – change in tax payable + change in other assets. CFO_{t-1}, CFO_t and CFO_{t+1} represent cash flow from operation for years t−1, t and t + 1, respectively. All variables are deflated by lagged total assets. Absolute values of the model's residuals are taken as estimations errors or proxies of EQ. So, the higher the estimation error, the lower is the EQ reported in the financial statement. Perotti and Wagenhofer (2014) multiply the absolute values by −1 to make such values an increasing function of better EQ. Thus, lower values mean inferior EQs, and the higher values denote better EQs.

Further, the study utilises McNichols (2002) model.

4.2.2. McNichols (2002) model

The model is a linear combination of the variables identified by Jones (1991) for determining the discretionary EQ and DD model mentioned above. Besides the variables used by DD, McNichols (2002) uses two additional variables, namely – Δ sales and PPE (property, plant and equipment) in his model. According to McNichols's (2002) model, the estimation results based on a large sample show that the explanatory power (measured by R^2) of the model is better than those of Jones (1991) and DD models.

The model is given below –

$$WCA_{i,t} = \mathfrak{x}_o + \mathfrak{x}_1 CFO_{i,t-1} + \mathfrak{x}_2 CFO_{i,t} + \mathfrak{x}_3 CFO_{i,t+1} + \mathfrak{x}_4 \Delta REV_{i,t} + \mathfrak{x}_5 \Delta PPE_{i,t} + \varepsilon_{i,t} \quad (2)$$

where, ΔREV is the change in sales and PPE is the plant, property and equipment. Both the variables are divided by lagged total assets. The remaining variables are the same as those of the DD model.

Here, the absolute values of the residuals obtained from equation (2) are also considered as measures of EQ. Further, we multiply the absolute value by −1 to make EQ an increasing function following Perotti and Wagenhofer (2014). Thus, '0' denotes no earning management. The higher the negative value, the lower will be the EQ. In the next stage, to determine the impact of EQ on debt financing, the following regressions models are employed:

$$Leverage_{it} = \phi_0 + \phi_1 EQCACC_{it} + \phi_2\ ROA_{it} + \phi_3\ \mathrm{RISK}_{it} + \phi_4\ \mathrm{PPE}_{it} + \ \phi_5 LNAge_{it} + \ \phi_6 PS_{it} + \ \phi_7 \mathrm{Growth}_{it} + \ \phi_8 \mathrm{IDummy}_{it} + e_{it} \quad (3)$$

$$Leverae_{it} = \gamma_0 + \gamma_1 EQTACC_{it} + \gamma_2 ROA_{it} + \gamma_3 Risk_{it} + \gamma_4 PPE_{it} + \gamma_5 LNAge_{it} + \gamma_6 PS_{it} + \gamma_7 Growth_{it} + \gamma_8 IDummy_{it} + \varepsilon_{it} \quad (4)$$

Where, leverage has been measured by interest-bearing long-term borrowings scaled TA_{t-1}, EQ_{CACC} represent the absolute values of the residuals derived from DD the Model (Equation 1) multiplied by −1, and EQ_{TACC} are the absolute values of the residuals derived from the McNichols Model (Equation 2) multiplied by -1, as described, ROA – a proxy for profitability is measured by operating profit/total assets, Risk is measured by the standard deviation of $EBITDA/TA_{t-1}$ for the past five years, PPE is plant property and equipment/TAt-1, being proxy for collateral securities or tangibility, growth is measured by a change in sales $[(Sales_t - Sales_{t-1})/Sales_{t-1}]$, LNAge is the natural logarithm of age of a firm at the end of the year, promoters' shareholding (PS) has been used as the proxy for concentration of shareholding, IDummy is industry dummy to capture industry characteristics, it is 1 when the firm belongs to IT (information technology) or Pharma industry, and 0 otherwise.

Endogeneity: The model we developed is based on the argument that bank finance is a function of EQ. Intuitively, and as per the literature (Ghosh & Moon, 2010), bank finance may also influence EQ. That is, EQ may be endogenous. In other words, there could be a two-way relationship between EQ and bank finance. If EQ is endogenous, the results of the equations (3) and (4) will be biased and inconsistent. In that event, the solution lies in estimating the equations through 2SLS regression using instrumental variable (IV)- to remove the bias and inconsistency. However, according to Wooldridge (2009), if the OLS estimators are exogeneous, 2SLS results will be less efficient. Hence, we first conduct Hausman's (1978) endogeneity test to ensure whether 2 SLS is necessary for estimating the models used. We take lag EQ values as the IV (instrumental variable) for the endogeneity test. According to Wooldridge (2009), the IV must be a variable determined outside the structural equation model, uncorrelated to the error term, and correlated with the explanatory variable (here, contemporaneous EQ). Under the DD and McNichols models, the lagged EQs fulfil all the criteria. They are outside equations 3 and 4 and, hence, uncorrelated to the equations' contemporaneous error terms. We find them positively correlated with the EQ_{CACC} (coefficient of correlation being 0.41), and EQ_{TACC} (coefficient of correlation being 0.47). Based on the results of the endogeneity test, we conclude that EQs of both the models are exogenous and 2 SLS is not necessary.

Piecewise Regression: According to the model, higher borrowing carries the benefit of better monitoring, which includes ensuring better EQ. However, an optimum EQ exists because attaining a higher EQ involves cost. The resulting cost of improvement of EQ beyond a certain limit offsets the benefit of debt financing. Thus, the relation is curvilinear – specifically, inverted U-shaped or concave down. In order to examine the curvilinear property of the relation, we conduct *piecewise regressions* whereby the EQs (exogenous) are organised in ascending order (lower to higher EQ). Then, we run regressions taking different class intervals. For piecewise regression, we rely on equation (4), which uses the McNichols model for EQ determination, as it subsumes all the variables of the DD model, and the same has a better explanatory power. Piecewise regression partitions the target exogenous variable- EQ, into many clusters and fits a separate line through each of them. This is a standard approach to estimation in empirical research in the event of data non-linearity (Gkioulekas & Papageorgiou, 2019; Arthur et al., 2019).

5. Empirical results

Table 1 details the descriptive statistics of the variables of the pooled sample of 1511 firm years.

Table 2 shows the correlation coefficients of the explanatory variables (except industry characteristics) of the pooled sample of 1511 firm years of Equations 3 and 4 above, along with VIF values.

The VIF values reveal no multicollinearity among the explanatory variables.

Table 3 reveals the relation between EQ and leverage after controlling for ROA, RISK, PPE, growth, age and industry characteristics.

Table 1. Descriptive statistics.

Variables	Mean	Median	Standard deviation
Leverage: D/A	0.3039	0.2857	0.2212
EQ_{CACC}	−0.6571	−0.1323	2.0593
EQ_{TACC}	−0.6657	−0.1249	2.0685
ROA	7.6474	6.6500	9.0219
RISK	0.0368	0.0216	0.1429
PPE	0.4259	0.4090	0.2470
LnAge	3.4857	3.4657	0.6360
PS	0.49	0.52	0.22
Growth	0.7620	0.1203	16.0871
Industry Dummy	0.1019	0.0000	0.3026

[a]Prepared by the authors

Table 2. Correlation matrix.

Variables	EQ_{CACC}	EQ_{TACC}	ROA	RISK	PPE	Growth	LN(AGE)	PS	VIF
EQ_{CACC}	1.0000								4.00
EQ_{TACC}	0.8656	1.0000							3.99
ROA	0.0455	0.0413	1.0000						1.02
RISK	0.0101	0.0154	0.0961	1.0000					1.03
PPE	−0.0545	−0.0430	0.0045	−0.0529	1.0000				1.01
LnAge	−0.0466	−0.0443	−0.0466	−0.1147	0.0368	−0.0379	1.0000		1.03
PS	−0.0623	−0.0716	0.0610	−0.0340	0.0301	−0.0835	0.0980	1.0000	1.03
Growth	0.0071	0.0069	−0.0267	0.0050	−0.0214	−0.0379	−0.0835	1	1.01[a]

[a]Prepared by the authors

Table 3. Panel regression results showing the relation between EQ and bank finance (N = 1511).

Explanatory Variables	Equation 3	Equation 4
Intercept	0.3902 (0.00) *	0.3900 (0.00)*
EQ_{CACC} (DD model)	−0.0039 (0.10) ***	–
EQ_{TACC} (McNichols Model)	–	−0.0039 (0.09)***
ROA	−1.1185 (0.00) *	−1.1188 (0.00)*
RISK	0.0769 (0.02) **	0.0773 (0.02)**
PPE	0.2082 (0.00)*	0.2086 (0.00)*
LNAge	−0.0276 (0.00)*	−0.0276 (0.00)*
PS	0.0053 (0.81)	0.0049 (0.82)
Growth	0.0005 (0.07)***	0.0005 (0.06)***
IDummy	−0.0154 (0.35)	−0.0154 (0.35)
R^2	0.27	0.27[a]

The numbers in the cells represent the coefficient values of the variables. The numbers in the parenthesis show the *p* values. *, **, *** represent significance at 1%, 5% and 10% respectively.
[a]Prepared by the authors

Empirical results show an overall negative relation between EQ and bank finance. We observe a negative relationship between ROA and bank finance, indicating profitable firms go for less bank finance. The result is consistent with the findings of Rajan and Zingales (1995). Risk, that is, earnings volatility, is positively associated with bank finance. We find PPE (proxy of collateral) is positively associated with high bank finance, and the result is consistent with earlier empirical results of Rajan and Zingales (1995), Jordan et al. (1998), and Hirota (1999) and 'trade-off' theory. Age is negatively associated with bank financing. The result is consistent with that of Berger and Udell (1998). We find that the growth is positively associated with the bank finance. The result is consistent with the 'trade-off' theory and the findings of Long and Malitz (1985).

For conducting piecewise regression, we first organised 1511 samples in the ascending order of the EQs (lower to higher EQs) detailed in the methodology. After that, we classify the sample in the following class intervals:

a. EQs below mean value, and above mean value. Then, we run the regression using Equation (4), using McNichols's (2002) model on each of the two EQ class intervals. The results of the piecewise regression-1 are reported in Table 4.
b. EQs are arranged in the class intervals of 0–10%, 11–20%, 21–30%, and 31%– 100%, and, again - we run the regression using the same Equation (4) on each of these EQ class intervals. The results of the piecewise regression 2 are reported in Table 5.

Table 4. Piecewise regression-1.

Explanatory variables	Below mean EQ (N = 287)	Above mean EQ (N = 1224)
Intercept	0.6197 (0.00)*	0.3346 (0.00)*
EQ_{TACC} (McNichols Model)	0.0033 (0.26)	−1.333 (0.00)*
ROA	−1.1184 (0.00)*	−1.0717 (0.00)*
RISK	0.1826 (0.38)	0.0759 (0.03)**
PPE	0.1690 (0.00)*	0.2302 (0.00)*
LnAge	−0.0634 (0.00)*	0.0226 (0.00)*
PS	−0.0385 (0.49)	−0.0053 (0.82)
Growth	0.0154 (0.98)	0.0005 (0.07)***
IDummy	−0.1317 (0.00)*	0.0017 (0.92)
R^2	0.37	0.26[a]

The numbers in the cells represent the coefficient values of the variables. The numbers in the parenthesis show the *p* values. *, **, *** represent significance at 1%, 5% and 10%, respectively.
[a]Prepared by the authors.

Table 5. Piecewise regression-2.

Explanatory variables	0–10% (N = 152)	11–20% (N = 151)	21–30% (N = 151)	31–100% (N = 1057)
Intercept	0.4316 (0.00)*	0.8154 (0.00)*	0.5305 (0.00)*	0.3216 (0.00)*
EQ_{TACC} (McNichols Model)	0.0057 (0.09)***	0.0213 (0.36)	0.0257 (0.88)	−0.0334 (0.64)
ROA	−1.1108 (0.00)*	−1.2175 (0.00)*	−1.6156 (0.00)*	−1.0205 (0.00)*
RISK	−0.2021 (0.44)	0.5729 (0.09)***	0.3603 (0.39)	0.0731 (0.03)**
PPE	0.1165 (0.08)***	0.2372 (0.00)*	0.1819 (0.00)*	0.2352 (0.00)*
LnAge	−0.0112 (0.66)	−0.1155 (0.00)*	−0.0316 (0.21)	−0.0197 (0.04)**
PS	0.6904 (0.43)	−0.1415 (0.04)**	−0.0763 (0.34)	0.0035 (0.89)
Growth	0.0141 (0.40)	0.0824 (0.09)***	0.0004 (0.18)	−0.0005 (0.60)
IDummy	−0.1502 (0.03)**	−0.084 (0.10)***	0.0142 (0.79)	0.0059 (0.75)
R^2	0.37	0.47	0.37	0.23[a]

The numbers in the cells represent the coefficient values of the variables. The numbers in the parenthesis show the p values. *, **, *** represent significance at 1%, 5% and 10% respectively.
[a]Prepared by the authors.

Table 4 shows a positive relation between EQ and bank finance until the mean EQ is attained. Post mean EQ, there is a point when the cost of improving EQ further, to avail of more bank finance, might exceed the benefit of the latter, and therefore, we get a negative coefficient of EQ. The empirical results are consistent with our theoretical model.

In order to explore further, in piecewise regression-2, the ascending order EQs are divided into 4 class intervals: 0–10%, 11–20%, 21–30%, and 31–100%. Then, we run the regression model (4) on each sub-sample. Table 5 shows the results of the piecewise regression- 2. Till 30% interval, we find a positive relation between EQ and bank finance. Further, in 1–10%, the positive relation is statistically significant. In 31–100%, the relation between EQ and bank finance is negative. The results of Table 5 reinforce the prediction of the theoretical model.

Figure 1 shows the scatter diagram we get when we plot bank finance as a function of EQ. The fitted polynomial trend line is found to be concave down in terms of our theoretical model.

*Robustness test***:** i) First, we use the residuals of the DD model (2002) to find EQ. As an alternative measure, we use the residuals of McNichols's (2002) model as EQ. The panel regression results of bank finance on EQ found using the two different models are reported in Table 3. In both cases, we find that the coefficients of EQ are negative and statistically significant. Similarly, we find that the directions of the control variables ROA, RISK, PPE, LnAge, and Growth are the same and statistically significant in both equations.

ii) we re-estimate the models on a winsorized sample in the second robustness test.

It is possible that our results are driven by very high and low values of EQs that may not reflect the genuine relationship between bank finance and EQ. We consider 90 percent values of EQ by dropping the topmost 5% and the lowest 5% EQ values from the overall sample and repeat the panel regression on the winsorized sample. The results are reported in Table 6.

The results of the winsorized sample reported in Table 6 show that the variables' direction and significance level are the same as those in Table 3. In fact, we find R2 value is more when we use McNichols's (2002) model, showing a better explanatory power of the winsorized samples because of the exclusion of the extreme values of the EQ.

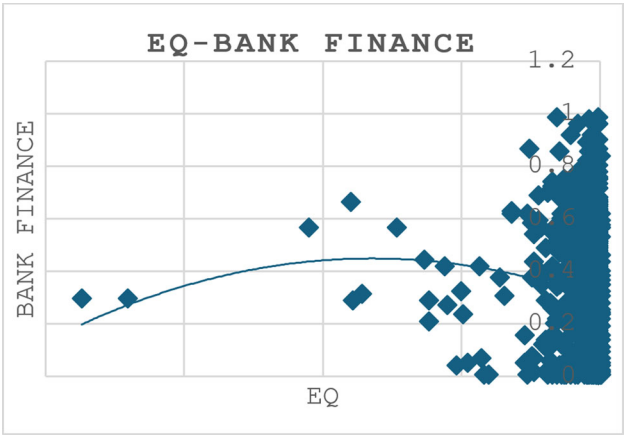

Figure 1. EQ and bank finance.

Table 6. Panel Regression results showing the relation between EQ and bank finance on winsorized sample (N = 1360).

Explanatory Variables	Equation 3	Equation 4
Intercept	0.3639(0.00)*	0.3934 (0.00)*
EQ_{CACC} (DD model)	−0.0522(0.00)*	–
EQ_{TACC} (McNichols Model)	–	−0.0498 (0.00)*
ROA	−1.0694(0.00)*	−1.1107(0.00)
RISK	0.0818 (0.02)**	0.0821(0.02)**
PPE	0.2193 (0.00)*	0.2253(0.00)*
LNAge	−0.0264(0.00)*	−0.0335(0.00)*
PS	−0.0027(0.91)	−0.0056 (0.81)
Growth	0.0006(0.06)***	0.0005 (0.07)***
IDummy	−0.231(0.17)	−0.0244(0.14)
R^2	0.27	0.29[a]

The numbers in the cells represent the coefficient values of the variables. The numbers in the parenthesis show the *p* values. *, **, *** represent significance at 1%, 5% and 10%, respectively.
[a]Prepared by the authors.

6. Discussion

The agency literature (Harris & Raviv, 1990; Jensen & Meckling, 1976) argues that the debt has a monitoring role in disciplining the behaviour of the managers. As an extension, we argue that for mitigating agency cost and moral hazard problems, - the lenders will be vigilant and keep an eye on financial accounting numbers reflecting efficient utilisation of resources and the genuineness of the collateral securities offered for procuring bank finance. Based on our argument, we develop a simple theoretical model that shows the likely relation between the EQ and the borrowing in a privately negotiated bank financing system. The model shows that a positive relation exists between the EQ and debt. Higher EQ should increase debt capacity. However, higher EQ comes with a cost. Beyond a point, the cost of achieving higher EQ exceeds the benefit of bank financing that accrues through superior monitoring; as such, the relation turns negative. Hence, the relationship between the EQ and debt is not linear but concave, and an optimum EQ level exists where the net benefit of bank financing is maximised.

After establishing our theoretical model, we empirically examine the relation between EQ and bank finance of 357 non-banking, non-finance-levered firms for seven years from 2013 to 2019. Altogether, we analyse the data of 1511 firm years. EQ has been found out by using Dechow and Dichev (2002) model or the DD model and McNichols's (2002) model. The relation between the EQ and bank finance in the overall panel regression after controlling for profitability, risk, tangibility, age, promoter shareholding, growth and industry-level characteristics is negative. The result is consistent with the theoretical model, as the high cost of better EQ as a condition for obtaining higher bank finance has an 'offsetting effect' compared to the overall benefit of better monitoring by the lenders. *So, the requirement of close monitoring to ensure higher EQ may discourage the higher bank finance.*

For piecewise regression, the sample of 1511 firm years is arranged in the ascending order (lower to higher quality) of EQ. Then, the sample is subdivided into various subsamples, and the regression is carried out on each subsample using the McNichols model (2002). Consistent with our theoretical

prediction, we find a positive relation between EQ and bank finance initially, and roughly after 30% of the ascending order EQ values, the relation turns negative.

In complying with the statutory requirements of preparation of the financial statements as per the accounting standards, audit of the accounts as per the auditing and assurance standard, oversight of the audit committee, role of the independent directors under the Companies Act, 2013, and compliance of clause 49 (dealing with the CG norms) of the SEBI[2] regulations – by all the listed companies, a minimum EQ is usually maintained, whether a company is levered or not. *In the case of the levered firms, the marginal cost of achieving better EQ than the usual one because of the banker's monitoring - is justified if the marginal benefit of monitoring exceeds the marginal cost of attaining better EQ. Thus, the monitoring must be effective to justify incurring additional costs to achieve better EQ than the usual one.*

The piecewise regression results suggest that the monitoring role of the lender is not effective after the initial stage to generate enough benefit to justify the higher cost of EQ; as such, the relation between the bank finance and the EQ turns negative relatively early (at 30% - even before the median value of EQ). The probable inadequacy of monitoring is supported by large NPAs of the banks amounting to 7% of the GDP (Motilal, 2018).

In all the regression results (overall and piecewise), we find that EQ is negatively related to profitability (ROA) and positively associated with tangibility or collateral securities (PPE).

The negative relation between bank finance and profitability shows that profitable firms go for less debt financing. The result is consistent with the pecking order theory (Myers, 1984). The positive relation between PPE and debt is consistent with Tirole's (2006) observation that adequate collateral securities are necessary to address moral hazard problems. In the absence of adequate collaterals, the borrower will indulge in self-dealing, and to compensate for the risk, the banker will charge a high interest, making a project unviable. The RBI and the ex-Governor of the RBI, Rajan (2016), also attach too much importance to collaterals for managing the default risk of the banks. The regression results on the entire sample show that the age of a firm is negatively related to bank financing, implying that long-surviving firms depend less on debt. Opposed to the findings of Titman and Wessels (1988) and Hirota (1999) supporting the trade-off theory, earnings variability implies risky operating cash flow and is positively associated with debt. In other words, it means banks tend to finance risky operations. Ownership concentration has no relation with bank finance. The result contradicts the finding of Ganguli (2013), who records a positive association between debt and ownership concentration during macroeconomic expansion.

7. Summary of findings and conclusion

The present study develops a model showing the incremental role of earning quality in determining debt in a negotiated banking system as an extension of the agency argument, followed by an empirical investigation of the model developed. The model highlights that there is a 'trade-off' between the benefit of debt financing and the cost of high EQ; that is, the relationship between the two is not linear but concave, and there exists an *optimum EQ level* where the net benefit of bank financing is maximised.

Consistent with our argument and model, the empirical results initially show a positive relation between EQ and bank finance. Till 10% of EQ arranged in ascending order (lower to higher values), the marginal gain of debt financing exceeds the marginal cost of EQ in a manner that can be considered significant statistically. After 30% of the EQ values, the relation between EQ and bank finance turns negative. The turning appears to occur quite early. Higher EQ- required for higher bank finance, is costly. The higher cost can be justified if the banker's monitoring and disciplining role (that ensures better EQ) is adequate and effective to justify the cost. The negative relation between EQ and bank finance that crystalises beyond 10% of EQ may indicate the banker's indifference or ineffectiveness of close monitoring to generate sufficient benefit required to meet the cost. The inadequacy of monitoring has the potential to create NPA problems as well, from the bankers' standpoint.

We also find a positive relation between earning variability (riskiness) and bank finance. This highlights that bankers appear to finance risky projects. Earning persistence means more sustainable earning (Dechow et al., 2010). Financing of the firms with less sustainable earnings increases the default risk of

the banks and confirms the inadequacy of vigilance by the bankers. This is a concurrent and consistent finding requiring a thorough investigation in future.

Our empirical results reveal that the monitoring by the bankers of the accounting numbers of the borrowing units may be suboptimal when the debt financing is high, and there appears to be a tendency to finance the firms with lesser sustainable earning. In 2018, the government-owned banks accounted for 70% of the total advances, whereas their contribution to NPA was 87%[3]. Cronyism and rent-seeking coupled with inadequate monitoring may be attributable to such systematic weaknesses (Anonymous, 2016; Kaul, 2015; Sharma, 2016; 2019; Thakurta, 2019). The deficiencies are sought to be overcome by over-reliance on collateral securities and paperwork rather than genuine monitoring of the operation of the firms. In the event of default, the legal process of recovery of the pledged assets is lengthy and cumbersome as the justice delivery system in India is bureaucratic, inefficient and too time-consuming (Singh & Thakur, 2019). In such a situation, to mitigate credit risk, the bankers should concentrate more on the borrowing firms' operating efficiency, ensuring the managers avoid self-dealing and empire-building by scrutinising accounting numbers rather than relying too heavily upon the collaterals.

In recent times, technological advancements, such as fintech, are transforming traditional tools of monitoring. Novel and innovative tools are applied by banks which enable real-time financial analysis and eventually helps in risk assessment of borrowers. AI and machine learning (ML) provide more accurate predictions of borrower behaviour, while blockchain improves the transaction security. Further, digital platforms can also assist in streamlining the compliance processes and provide more efficient credit monitoring systems, reducing reliance on traditional collateral-based assessments. AI and ML can be applied in back-office applications, document digitisation and processes, compliance monitoring and reporting, customer service and support to name a few. These advancements allow banks to adopt a more holistic and dynamic approach to monitoring, aligning with the rapidly evolving financial ecosystem.

The future theoretical and empirical research agenda should aim at finding the appropriate proxies for monitoring the role of the bankers that lead to the reduction of moral hazard and default risk problems of the borrowing firms.

Notes

1. Master Circular- Loans and Advances – Statutory and Other Restrictions (RBI/2015-16/95) https://www.rbi.org.in›BS_ViewMasCirculardetails
2. Securities and Exchange Board of India – A statutory regulatory body established by the Government of India in 1992 for protecting the interest of the investors investing in the securities along with regulating the securities market.
3. https://www.livemint.com/Opinion/arQr1ZUW9EI51qwmF7lqJN/The-status-of-public-sector-banks-in-India-today.html.

Acknowledgement

Authors would like to express their deepest gratitude to Dr. Debabrata Datta, Professor of Economics (Institute of Management Technology, Ghaziabad, India) for his unwavering support and guidance throughout this research work.

Author contributions

Dr. Santanu K. Ganguli played a pivotal role in conceptualizing the research framework and laying the foundational idea. Dr. Ganguli has also built the model used in the study. Dr. Ketan Mulchandani made significant contributions by meticulously collecting and analyzing data. Dr. Kalyani Mulchandani and Dr. Santanu K. Ganguli dedicated their expertise to conducting thorough literature reviews and crafting the written components of the research and played a crucial role in drafting the manuscript and providing insightful critiques to enhance its intellectual depth.

Disclosure statement

No potential conflict of interest was reported by the author(s). The authors have no conflicts of interest to declare. All co-authors have seen and agree with the contents of the manuscript and there is no financial interest to report. We certify that the submission is original work and is not under review at any other publication.

Funding

The authors received no direct or indirect funding for this research.

About the authors

Dr. Ketan Mulchandani, an accomplished finance professional and academic, serves as a Professor of Finance at K.J. Somaiya Institute of Management, Mumbai. With a Ph.D. and certifications like FRM, FMVA, and CFA (Level III candidate), he has over 16 years of experience, including teaching and industry roles. Dr. Mulchandani's research focuses on financial performance, ESG, and risk management, with publications in ABDC and Scopus-indexed journals. His teaching areas include Corporate Finance, Derivatives, Financial Markets and Alternative Investments.

Dr Santanu K. Ganguli is affiliated to Jaipuria Institute of Management, Noida, NCR, India as professor of finance. He is a chartered accountant (FCA) and PhD in finance. He has an experience spanning over 37 years in industry and academics. He has been a visiting faculty of many national and International institutes and universities that include the university of Warshaw, Poland and the Institute of Management Technology, Dubai. He is a prolific researcher on corporate finance, corporate governance and accounting. He has presented papers on finance in international conferences, including twice (2013 and 2017) in the Cambridge University (UK), University of London (UK in 2016,) University of Florida - Miami - USA- in 2011 where he obtained the best presenter award. His teaching areas include corporate Finance, Financial Statement Analysis for Valuation, Portfolio Management, Derivatives, Fixed Income Securities and International Financial Management. He is columnist for many economics and finance dailies.

Dr. Kalyani Mulchandani is an academician with a strong focus on finance and research. Currently an Associate Professor at SVKM's NMIMS University, she has published extensively in ABDC and Scopus-indexed journals, addressing topics such as earnings management, ESG reporting, and corporate governance. Her teaching areas include Corporate Finance, Financial Analysis and Derivatives.

ORCID

Ketan Mulchandani http://orcid.org/0000-0002-1226-6610

Data availability statement

Data for the research is available upon request.

References

Ahn, S., & Choi, W. (2009). The role of bank monitoring in corporate governance: Evidence from borrowers' earnings management behavior. *Journal of Banking & Finance*, *33*(2), 425–434. https://doi.org/10.1016/j.jbankfin.2008.08.013

Alderson, M. J., & Betker, B. L. (1995). Liquidation costs and capital structure. *Journal of Financial Economics*, *39*(1), 45–69. https://doi.org/10.1016/0304-405X(94)00825-L

Anonymous. (2016). July 7). Crony capitalism led to banks giving loans indiscriminately. Financial Express Retrieved May 17, 2021, from https://www.financialexpress.com/india-news

Arthur, N., Chen, H., & Tang, Q. (2019). Corporate ownership concentration and financial reporting quality: International evidence. *Journal of Financial Reporting and Accounting*, *17*(1), 104–132. https://doi.org/10.1108/JFRA-07-2017-0051

Beatty, A., Chamberlain, S. L., & Magliolo, J. (1995). Managing financial reports of commercial banks: The influence of taxes, regulatory capital, and earnings. *Journal of Accounting Research*, *33*(2), 231–261. https://doi.org/10.2307/2491487

Berger, A. N., & Udell, G. F. (1998). The economics of small business finance: The roles of private equity and debt markets in the financial growth cycle. *Journal of Banking & Finance*, *22*(6–8), 613–673.

Bigus, J., & Weicker, M. (2024). Relationship banking and firms' earnings quality–Does it matter whether banks are creditors or owners? *Journal of Banking & Finance*, *159*, 107050. https://doi.org/10.1016/j.jbankfin.2023.107050

Carmo, C. R., Moreira, J. A. C., & Miranda, M. C. S. (2016). Earnings quality and cost of debt: Evidence from Portuguese private companies. *Journal of Financial Reporting and Accounting*, *14*(2), 178–197. https://doi.org/10.1108/JFRA-08-2014-0065

Dechow, P. M., & Dichev, I. D. (2002). The quality of accruals and earnings: The role of accrual estimation errors. *The Accounting Review*, *77*(s-1), 35–59. https://doi.org/10.2308/accr.2002.77.s-1.35

Dechow, P., Ge, W., & Schrand, C. (2010). Understanding earnings quality: A review of the proxies, their determinants and their consequences. *Journal of Accounting and Economics*, *50*(2–3), 344–401. https://doi.org/10.1016/j.jacceco.2010.09.001

Dechow, P. M., & Schrand, C. M. (2004). Earnings quality. *The Research Foundation of CFA Institute*, https://doi.org/10.2469/cp.v2004.n3.3394

Galai, D., & Masulis, R. W. (1976). The option pricing model and the risk factor of stock. *Journal of Financial Economics*, *3*(1–2), 53–81. https://doi.org/10.1016/0304-405X(76)90020-9

Ganguli, S. K. (2013). Capital structure–does ownership.
structure matter? Theory and Indian evidence. *Studies in Economics and Finance*, *30*(1), 56–72. https://doi.org/10.1108/10867371311300982

Ganguli, S. K., & Guha Deb, S. (2023). Public sector bank dominated financing and earning quality: Indian evidence. *Journal of Asia Business Studies*, *17*(1), 1–14. https://doi.org/10.1108/JABS-03-2021-0116

Ghosh, A., & Moon, D. (2010). Corporate debt financing and earnings quality. *Journal of Business Finance & Accounting*, *37*(5–6), 538–559. https://doi.org/10.1111/j.1468-5957.2010.02194.x

Gkioulekas, I., & Papageorgiou, L. G. (2019). Piecewise regression analysis through information criteria using mathematical programming. *Expert Systems with Applications*, *121*, 362–372. https://doi.org/10.1016/j.eswa.2018.12.013

Harris, M., & Raviv, A. (1990). Capital structure and the informational role of debt. *The Journal of Finance*, *45*(2), 321–349. https://doi.org/10.1111/j.1540-6261.1990.tb03693.x

Hausman, J. A. (1978). Specification tests in econometrics. *Econometrica*, *46*(6), 1251–1271. https://doi.org/10.2307/1913827

Hirota, S. I. (1999). Are corporate financing decisions different in Japan? An empirical study on capital structure. *Journal of the Japanese and International Economies*, *13*(3), 201–229. https://doi.org/10.1006/jjie.1999.0435

Hoang, T. C., Abeysekera, I., & Ma, S. (2017). The effect of board diversity on earnings quality: An empirical study of listed firms in Vietnam. *Australian Accounting Review*, *27*(2), 146–163. https://doi.org/10.1111/auar.12128

Jadiyappa, N., Iyer, S. R., & Jyothi, P. (2021). Does social responsibility improve firm value? Evidence from mandatory corporate social responsibility regulations in India. *International Review of Finance*, *21*(2), 653–660. https://doi.org/10.1111/irfi.12282

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, *3*(4), 305–360. https://doi.org/10.1016/0304-405X(76)90026-X

Jones, J. J. (1991). Earnings management during import relief investigations. *Journal of Accounting Research*, *29*(2), 193–228. https://doi.org/10.2307/2491047

Jordan, J., Lowe, J., & Taylor, P. (1998). Strategy and financial policy in UK small firms. *Journal of Business Finance & Accounting*, *25*(1–2), 1–27. https://doi.org/10.1111/1468-5957.00176

Kaul, V. (2015). February 25). Crony capitalism: The truth about Indian banking is finally coming out. *First Post*. Retrieved May 17 2021 from https://www.firstpost.com

Le, H. T. T., Vo, X. V., & Vo, T. T. (2021). Accruals quality and the cost of debt: Evidence from Vietnam. *International Review of Financial Analysis*, *76*, 101726. https://doi.org/10.1016/j.irfa.2021.101726

Long, M. S., & Malitz, I. B. (1985). Investment patterns and financial leverage. In Benjamin M. Friedman (Eds.), *Corporate capital structures in the United States*. (pp. 325–352). University of Chicago Press.

McNichols, M. F. (2002). Discussion of the quality of accruals and earnings: The role of accrual estimation errors. *The Accounting Review*, *77*(s-1), 61–69. https://doi.org/10.2308/accr.2002.77.s-1.61

Modani, K., Dash, S. R., Raithatha, M., & Brooks, R. (2023). Sentiment and accruals earnings management: Does governance and regulatory environment matter? *American Business Review*, *26*(2), 314–354. https://doi.org/10.37625/abr.26.2.314-354

Modigliani, F., & Miller, M. H. (1963). Corporate income taxes and the cost of capital: A correction. *The American Economic Review*, *53*(3), 433–443.

Motilal, O. (2018). What does Prompt Corrective Action (PCA) mean for PSU banks. Retrieved August 12, 2021, from https://www.motilaloswal.com/article_new.aspx/1231/What-does-Prompt-Corrective-Action-(PCA)-mean-for-PSU-banks

Myers, S. C. (1977). Determinants of corporate borrowing. *Journal of Financial Economics*, *5*(2), 147–175. https://doi.org/10.1016/0304-405X(77)90015-0

Myers, S. C. (1984). Capital structure puzzle. *The Journal of Finance*, *39*(3), 574–592. https://doi.org/10.1111/j.1540-6261.1984.tb03646.x

Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, *13*(2), 187–221. https://doi.org/10.1016/0304-405X(84)90023-0

Nguyen, Q., Kim, M. H., & Ali, S. (2024). Corporate governance and earnings management: Evidence from Vietnamese listed firms. *International Review of Economics & Finance*, *89*, 775–801. https://doi.org/10.1016/j.iref.2023.07.084

Pandey, A., & Guhathakurta, K. (2019). Nonperforming loan auction: Prudent policy response or earnings management? *Journal of Public Affairs*, *19*(4), e1936. https://doi.org/10.1002/pa.1936

Penman, S. H. (2003). The quality of financial statements: Perspective from the recent stock market bubble. *Accounting Horizons*, *17*(s-1), 77–96. https://doi.org/10.2308/acch.2003.17.s-1.77

Perotti, P., & Wagenhofer, A. (2014). Earnings quality measures and excess returns. *Journal of Business Finance & Accounting*, *41*(5–6), 545–571. https://doi.org/10.1111/jbfa.12071

Rajan, R. G., & Zingales, L. (1995). What do we know about capital structure? Some evidence from international data. *The Journal of Finance*, *50*(5), 1421–1460. https://doi.org/10.1111/j.1540-6261.1995.tb05184.x

Rajan, R. (2016). Resolving stress in the banking system. *RBI Bulletin at ASSOCHAM – Interactive Meet with Industry & Trade, Bengaluru*. Retrieved July 16, 2021, from https://rbidocs.rbi.org.in/rdocs/Bulletin/PDFs

Reserve Bank of India. (2010). Master Circular – Reserve Bank of India. Retrieved September 16, 2021from https://www.rbi.org.in/scripts/Bs_ViewMasCirculardetails.aspx?id=5817

Rezaee, Z., & Safarzadeh, M. H. (2023). Corporate governance and earnings quality: The behavioral theory of corporate governance (evidence from Iran). *Corporate Governance: The International Journal of Business in Society*, *23*(1), 189–218. https://doi.org/10.1108/CG-08-2021-0289

Sayers, R. S. (1967). *Modern banking*. Clarendon Press.

Sengupta, R., & Anand, V. (2014). Corporate debt market in India: Issues and challenges. *MPRA Paper No. 53945*. Retrieved January 15, 2022, from http://mpra.ub.uni-muenchen.de/53495

Sharma, R. (2016). *The rise and fall of nations: Forces of change in the post-crisis world*. WW Norton & Company.

Sharma, M. (2019, July 15). View: Modi should starve India's state banks, not celebrate them. *The Economic Times*. Retrieved July 15 2021 from https://economictimes.indiatimes.com/industry/banking/finance/banking/view-modi-should-starve-indias-state-banks-not-celebrate-them/articleshow/70287131.cms?from=mdr

Shleifer, A., & Vishny, R. W. (1997). A survey of corporate governance. *The Journal of Finance*, *52*(2), 737–783. https://doi.org/10.1111/j.1540-6261.1997.tb04820.x

Singh, T., & Thakur, A. S. (2019). Administration of justice: Judicial delays in India. *Indian Journal of Public Administration*, *65*(4), 885–896. https://doi.org/10.1177/0019556119873451

Tahir, M., Shah, S. S. A., Sayal, A. U., & Afridi, M. A. (2020). Loan quality: Does bank corporate governance matter? *Applied Economics Letters*, *27*(8), 633–636. https://doi.org/10.1080/13504851.2020.1728223

Thakurta, P. G. (2019, August 15). Crony capitalism is alive and kicking. *National Herald*. Retrieved May 22 2021 from https://www.nationalheraldindia.com/opinion/crony-capitalism-is-alive-and-kicking

Tirole, J. (2006). *The theory of corporate finance*. Princeton University Press.

Titman, S., & Wessels, R. (1988). The determinants of capital structure choice. *The Journal of Finance*, *43*(1), 1–19. https://doi.org/10.1111/j.1540-6261.1988.tb02585.x

Wiwattanakantang, Y. (1999). An empirical study on the determinants of the capital structure of Thai firms. *Pacific-Basin Finance Journal*, *7*(3–4), 371–403. https://doi.org/10.1016/S0927-538X(99)00007-4

Wooldridge, J. M. (2009). On estimating firm-level production functions using proxy variables to control for unobservables. *Economics Letters*, *104*(3), 112–114. https://doi.org/10.1016/j.econlet.2009.04.026